MANITOBA RESEARCH COUNCIL ANNUAL REPORT 1986 - 1987

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A printed edition using the identical text, for public information and promotional distribution,is currently being prepared.

June 30, 1987

Honorable Vic Schroeder
Minister of Industry, Trade & Technology
Room 358, Legislative Building
Winnipeg, Manitoba
R3C 0V8

Dear Mr. Schroeder:

I am pleased to submit, for your consideration, the Annual Report of the Manitoba Research Council for the fiscal year ended March 31, 1987.

Yours Sincerely,

Marion Vaisey-Genser

Marion Vaisey-Genser
Chair

THE MANITOBA RESEARCH COUNCIL

Working closely with industry, government and labour, the Manitoba Research Council (MRC) plays a lead role in encouraging and facilitating scientific research and technological development.

The MRC, an agency of the Province of Manitoba, also advises the government on developments in new technologies as they relate to the social and economic prospects of the province.

The MRC has three divisions: the Canadian Food Products Development Centre (CFPDC) in Portage la Prairie, the Industrial Technology Centre (ITC) in Winnipeg, and the Administration Division located in downtown Winnipeg.

Through the Canadian Food Products Development Centre and the Industrial Technology Centre, the MRC assists industry in the development and implementation of technology. CFPDC specializes in the development and testing of food, feed, and beverage products, and ITC provides all other products development and testing services to industry.

MRC's Administration Division provides support services to the two operating divisions and to the Council.

ANNUAL REPORT FROM THE CHAIR

These are challenging times for us all. Times when all organizations must learn to change quickly to accommodate technological advances and rapidly varying conditions. The ability to respond promptly to technological change is especially critical for MRC in fulfilling its mandated role of providing technology transfer and technical support to Manitoba's wide variety of small and medium sized industrial enterprises.

During the year several steps were taken to enhance MRC's important industrial assistance role. As a first step, a strategic management approach was initiated. One of the initial results was internal reorganization to provide a more refined matching of technical skills and capabilities with existing and near-term industry needs.

A second step was a concentrated effort by management to improve local and regional networking to expand the technical expertise available to industry through MRC. During the year, a memorandum of agreement and understanding was initiated with the University of Manitoba and, at year-end, a second agreement was signed with the Saskatchewan Research Council. Both of these agreements will permit MRC to mobilize additional technical capabilities and expertise to provide a more comprehensive set of consulting and technology transfer services to Manitoba industry.

MRC, with its mandate to strengthen the effective use of science and technology, appropriate to the social and economic development of Manitoba, has four principal functions. These are:

- to identify and evaluate scientific and technological opportunities, challenges and directions and to propose science and technology goals.
- to maintain scientific and technological capabilities to promote the introduction, understanding, evaluation and application of appropriate technologies.
- to disseminate scientific and technical information and to provide a comprehensive technical information service in support of Manitoba's needs, including the collection of data indicative of technical capacity, activities and development potential in the province.
- to operate laboratory facilities to perform relevant testing, analysis, research, development and demonstration activities in support of local industries.

In fulfilling the above functions, Council plays an important advisory role to the Province. A noteworthy task during the year was Council's contribution to the development of Manitoba's input leading to the formulation of the national science and technology policy.

Several membership changes on the Council occurred during the year. On the recommendation of Council, a staggered system of Council appointments has been instituted to permit replacement of about one-third of the fifteen person Council on an annual basis. This procedure was adopted to provide Council continuity while, at the same time, permitting the introduction of new Council talent on a planned, on-going basis.

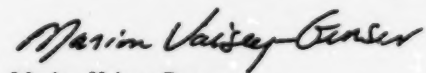
The following Board members retired during the year: Mr. Vir Bharti, Mr. Ralph Bullock, Dr. James Jamieson, Mr. Roy Locke, Mr. Robert McLeod, Dr. Joel Novek, Mr. Ken Petrie and Ms. Sari Tudiver.

On behalf of the Council, I wish to thank these members for their invaluable contribution over the past three years.

I am also pleased to welcome the following new members to Council: Mr. Dennis Atkinson, Ms. Devinder Bhullar, Mr. Bob Malazdrewich, Dr. Ross McCormack, Ms. Ginny McKillop, Mr. George Rajotte, Dr. Jim Reichert and Mr. Les Tough.

Council's Executive Director, Dr. E.O. Nyborg, deserves a special word of appreciation. His commitment to the goals of Council and his guidance make our work possible. His sensitivity to the needs of MRC staff and its laboratories assure the ongoing development of these important provincial resources.

I wish to acknowledge the continued strong support from the government of Manitoba and the Honourable Vic Schroeder, Minister of Industry, Trade & Technology. In addition, I wish to acknowledge the dedication of our Council members and the hard work and achievements of our staff.

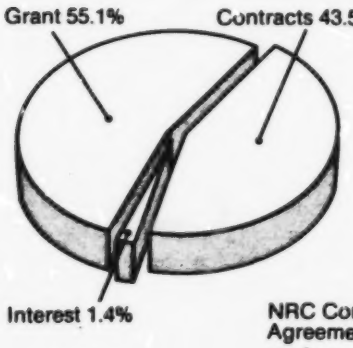


Marion Vaisey-Genser
Chair, Manitoba Research Council

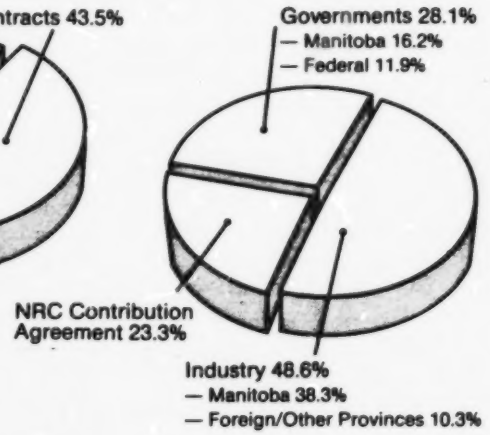
FINANCIAL SUMMARY

Income	1986/87	1985/86
Contracts	$2,330,778	$2,295,491
Grant from Province of Manitoba	2,957,000	3,063,799
Interest	77,033	35,600
Expenses		
Operating	4,652,954	4,622,043
Capital	541,520	634,609
Net Income	$ 170,337	$ 138,238

SOURCES OF REVENUE 1986/87

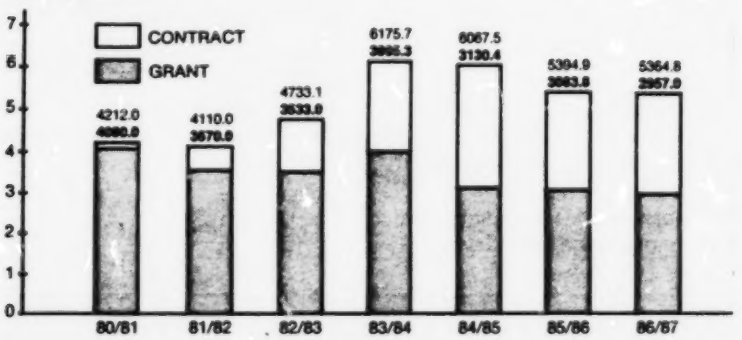


SOURCES OF CONTRACTS 1986/87



SEVEN YEAR SUMMARY

millions of dollars



EXECUTIVE DIRECTOR'S REPORT

In carrying out its mandate of "strengthening the effective use of science and technology, appropriate to the economic and social development of Manitoba," MRC provides an important technological link in the industry-university-government infrastructure in support of provincial economic development.

During the year, significant steps were taken in networking and cementing relationships with industry, universities, research organizations, and government departments to enhance MRC's focal technology transfer role within Manitoba. By utilizing the collective strengths of the Canadian technological infrastructure MRC can better satisfy its mandated support role for Manitoba industry. The most noteworthy steps during the year in this regard, were the development of agreements with the University of Manitoba and with the Saskatchewan Research Council for the provision of specialized technical support and capabilities. As well, as is noted later, the Advisory Committee for the Industrial Technology Centre was restructured to provide industry appointed representation from many major Manitoba industry associations.

Manitoba is unique in western Canada with its large proportion of companies in the manufacturing sector. Most of the 1700 Manitoba companies in this sector are small and medium sized enterprises (SME's). MRC recognizes the importance of SME's to the provincial economy and the unique needs that they have for technical information, specialized technical services and appropriate technology. To this end, MRC underwent significant restructuring and repositioning during the year to increase its commitment, accessibility and range of services to local SME clients. This was done with the realization that MRC's two most important values are our clients needs and our staff expertise. Only by matching both, with a commitment for excellence, can we be effective in our ongoing and ever-changing role of transferring technology relevant to the long term economic development of Manitoba.

MRC's total revenue for 1986/87 was $5.365 million as compared to $5.395 million for 1985/86. Contract revenue in 1986/87 was $2.331 million as compared to $2.295 million in 1985/86. Overall self sufficiency increased to 45% from a level of 43% in the previous year. During 1986/87, 48.6% of contract revenue was from contracts with industry, while 28.1% was from contracts with federal or provincial government departments. The proportion of contract revenue from industry outside Manitoba increased from 2.7% in 1985/86 to 10.3% in 1986/87. Five hundred and ninety contracts were completed during the year. The average value of each contract was $3950, which illustrates the large proportion of small contracts conducted for Manitoba SME's.

Total contract revenue for the Canadian Food Products Development Centre increased by 27% from $690 thousand in 1985/86 to $877 thousand in 1986/87. Of the 1986/87 contract revenue, 55.8% was for industrial clients. CFPDC completed 113 contracts during the year.

Total contract revenue for the Industrial Technology Centre was down by 9% from a level of $1.61 million in 1985/86 to $1.453 million in 1986/87. Of the 1986/87 contract revenue, 43.4% was for industrial clients. ITC completed 477 contracts during the year, with 420 of these contracts for Manitoba industry.

Under MRC's industrial advisory service, which is supported both by the National Research Council IRAP contribution agreement and by the grant from the Province of Manitoba, 3006 clients were served during the year. The total number of client contacts was 6627, which is 109% of the previous years level. 66% of these clients were in Winnipeg, while 32% were in rural Manitoba and 2% were out of province.

During the year, MRC continued to benefit from its membership in the Association of Provincial Research Organizations, Inc. This association has membership of the eight provincial research organizations. This research, development and testing network, which is closely aligned with the NRC-IRAP field network, represents the principal technology transfer network to Canadian SME's.

I wish to acknowledge the continued grant support from the province which makes it possible for MRC to provide its local technology transfer infrastructure. I also wish to acknowledge the continued partnership and support from the National Research Council in the provision of Manitoba IRAP field services.

I wish to thank the Council for their valued advice and guidance and I especially wish to thank the members of the executive committee, Marion Vaisey-Genser, Mahesh Chaturvedi, and John Ingraham for their tireless dedication and hard work.

Finally, I wish to thank MRC's most valuable resource, our staff, for their flexibility, professionalism and dedication in making MRC an effective resource for Manitoba industry.

E. Nyborg

Erling Nyborg
Executive Director, Manitoba Research Council

THE CANADIAN FOOD PRODUCTS DEVELOPMENT CENTRE

The Canadian Food Products Development Centre (CFPDC) was established jointly in 1978 by the Province of Manitoba and the Federal Government of Canada in response to the need for a facility capable of providing product research, development and testing services to the national food, feed and beverage industries.

CFPDC provides centralized access, on a contractural and confidential basis, to product testing, development, research and pilot-scale production facilities. More importantly, it offers clients the expertise and experience of a dedicated team of food technologists, engineers, technicians and consultants: the resources clients need to develop new and better products and more cost-effective production techniques.

CFPDC PROGRAMS:

Technical Advisory Services — Technical information services provide industrial clients with access to extensive holdings of books, journals, catalogues, standards and regulations relating to the food industry. In addition, world-wide information is available through computer access to more than 200 technical databases. During the year project and in-house reports, book holdings, shadow literature and directories were listed on a computerized data base. About 2700 records can be accessed by this thesaurus. Industrial field advisory services and access to financial assistance programs are provided to industry through funding from both the National Research Council Industrial Research Assistance Program and the grant from the province of Manitoba.

Product Development Services — Product development activities range from turning an idea into a new food product to developing uses for by-products. Expertise and equipment are available to conduct flavour, colour and texture analyses, as well as sensory evaluation to suit home, restaurant and institutional food requirements.

Microbiological Services — Microbiological laboratories are equipped to evaluate foods for spoilage and pathogenic organisms. Facilities for both enumeration and identification of micro-organisms are available on site, including consulting assistance in food plant sanitation.

Chemical Analysis Services — Chemical analysis services range from routine protein, fat and moisture determinations to sophisticated tests for trace contaminants. In addition to a well-equipped wet chemistry facility, instrumental capabilities include gas chromatography with flame ionization, nitrogen-phosphorous, and electronic capture detectors. HPLC capability includes gradients, computer workstation and refractive index, variable wavelength UV, and spectrofluorescence detectors.

Food Engineering Services — Food engineering services include consulting assistance in process development and optimization, equipment specification and selection, plant layout and design and energy conservation.

Pilot Plant Facilities — The pilot plant facility is equipped and serviced for production of new food products on a trial basis. Technical skills and equipment are available to assist with process development in the areas of dairy, meat products, fruit and vegetables, and cereal technology (including baking). Processing capabilities include cooking, blanching, freezing, battering and breading, drying and membrane separation.

An Odenberg continuous food processor was acquired during the year. This pilot-scale equipment has the capability of steam blanching vegetables, cooking meats and vegetables and steam-peeling potatoes. The pilot plant is Meat Hygiene Directorate-inspected so test products containing meat can be distributed interprovincially and internationally.

HIGHLIGHTS OF CFPDC ACTIVITIES:

Contract Services — Contract revenue during the year was $877 thousand, representing a 27 percent increase over the previous year. One hundred and thirteen contracts were completed, representing an average contract value of $7760. Of the total contract revenue 55.8 percent was from industry sources, 22.6 percent from federal and provincial contracts and 21.6 percent from the National Research Council IRAP contribution agreement.

Technical Advisory Services — Under the technical advisory services program, supported by the NRC-IRAP contribution agreement and the provincial grant, 1,962 client contacts were made during the year, representing a 35 percent increase in activities over the previous year. Of the clients served, 60 percent were in Winnipeg, 34 percent in rural Manitoba and 6 percent outside the province.

Project Highlights:

- A Winnipeg client is currently test marketing a gourmet barbecue sauce developed at the Centre. CFPDC was also utilized to produce the test-market quantities.
- Test marketing of a uniquely flavoured pancake syrup is currently underway by a Winnipeg client. The Centre was utilized for both development of the syrup and production of test-market quantities.
- Two consumer studies were conducted for a major Winnipeg processor prior to and concurrent with a new product launch.
- Preliminary assistance with product development, packaging and labelling of an ethnic food product encouraged the establishment of a Winnipeg restaurant which also serves as a retail outlet for the frozen, packaged food product.
- CFPDC in conjunction with the University of Manitoba has completed two years of a three year program to assess the potential for a frozen, sweet corn industry in Manitoba. The Centre is providing the processing facility and product evaluation.
- A successful project was completed to develop a beef jerky process. CFPDC is now producing test market quantities of beef jerky for the client.
- Evaluation of potential membrane separation applications in the food industry is well underway. This project is funded by the provincial Strategic Research Support Program. Two additional projects in this area are being negotiated as a result of this evaluation.
- An evaluation of irradiation treatment of selected Manitoba food products was completed. A total of 18 different foods or food ingredients were examined for potential commercial application. In conjunction with researchers at the Whiteshell Nuclear Research Establishment, a paper dealing with irradiating whitefish has been submitted for publication in the *Journal of Radiation Physics and Chemistry.*
- A survey of Manitoba raw milk was conducted to determine the extent of the occurrence of three major newly emerging pathogens. In general, our isolation rates were quite low compared to similar studies, indicating the overall satisfactory condition of milk and dairy products in Manitoba. However, the dangers of milk-borne infections, particularly from raw milk, are significant. Further work on other items are indicated, especially related to LISTERIA in mildly heat-treated foods.
- A grant from Canada Manpower enabled a small meat processor to send three staff members to CFPDC for a one week short course. The course consisted of lectures and demonstrations of basic and new meat processing techniques with an emphasis on quality control and sanitation.
- All products sold by the Manitoba Liquor Control Commission are now tested by CFPDC for quality factors and contaminants. Testing included boutique products. New listings were also tested before they were distributed to stores and customer complaint samples were analyzed.
- About 1,000 samples from western Canadian honey producers and processors were tested for sulfathiazole residues. Sulfathiazole is a disease-controlling antibiotic given to honey bees.
- A rural Manitoba bird seed packaging operation began manufacturing and distributing bird seed bells based on formulations developed at CFPDC.
- During the year, CFPDC developed the capacity to measure amino acids in physiological samples, as part of a program to support the development of special nutrition products.
- Several small edible oil testing projects were conducted for clients in both Canada and the U.S.A.
- Numerous compositional tests on milk, feed products, bread and other foods were performed.
- Several product development projects were undertaken: a dried soup mix, ethnic finger foods, gourmet frozen dinner entrees, and food-service items such as vegetable side dishes and breaded patties using Manitoba freshwater fish.
- A three day food technology course was conducted by CFPDC for 22 National Research Council field staff from across Canada. Presentations were made by Centre staff and other experts in the field. Topics covered included sanitation, dairy products, fruits and vegetables, cereals, bakery products, poultry and red meat, future technology and market trends, packaging, quality control regulations, quality assurance and basic food chemistry.

FOOD PRODUCTS ADVISORY COMMITTEE

The Canadian Food Products Development Centre uses an industry-based food products advisory committee to aid in the formulation of programs and the definition of new initiatives which meet the needs of Manitoba industry. 1986/87 advisory committee members were:

Mr. H.D. McRorie (Chairman), Royal Bank; Dr. W. Bushuk, University of Manitoba; Dr. E.A. Earl, Canola Council of Canada; Mr. D. Jones, Campbell Soup Co. Ltd.; Mr. S. Ridgway, Canada Dept. of Regional Industrial Expansion; Mr. B. Sandercock, Manitoba Dept. of Agriculture; Mr. T. Van Rosmalen, Agriculture Canada; Mr. A.R. Tweed, Woodstone Foods; and Mr. M.F. Wallace, Manitoba Dept. of Industry, Trade & Technology.

MRC acknowledges the valuable contribution, guidance and advice of this committee.

THE INDUSTRIAL TECHNOLOGY CENTRE

The Industrial Technology Centre (ITC) was established jointly in 1978 by the Province of Manitoba and the Federal Government of Canada to help Manitoba industries capitalize on the increased efficiency and productivity possible through the use of applied technology.

ITC is a unique, full-service product testing and development facility, containing the most up-to-date equipment, extensive research resources and capable staff. Expertise is maintained in biotechnology, chemical technology, computer-aided engineering, electrical and electronics engineering, mechanical engineering and materials engineering. The Technology Centre helps both large and small Manitoba companies by solving technical problems, and developing improved products and production techniques.

ITC PROGRAMS:

Technology Advisory Services — A variety of information services are provided to industry clients at minimal cost or with no charge. These services include literature searches, library loans, fact finding and patent information. The Centre recognizes that many clients require assistance in evaluating manufacturing and production processes, assessing the viability of current and leading edge technologies, assessing computer options and defining the requirements of research and development projects. To address these needs, the Centre provides no-charge advisory services to Manitoba industry in these areas. This service is funded both by the province and by the National Research Council.

Electrical/Electronics Service — Electrical and electronics engineering staff and equipment are available to perform design, product development assistance and general consulting services. Design services include electronic circuit design, printed circuit board design, communications systems design and industrial applications. Product development services include product selection assistance and product testing and evaluation.

Mechanical Design and Analysis Service — Mechanical engineering staff provide product design and analysis assistance to industrial and government clients. Technical problems solved include product design, function, structural integrity, system dynamics, safety and cost effectiveness. Specialized analyses and services are available in areas of vibration and noise control.

Prototype/Product Fabrication Services — This facility offers custom machining and fabrication services to produce and test prototypes to customer specifications.

Product Testing Service — Client testing services enable products to be tested to many national standards and regulations. The Centre is accredited by the Standards Council of Canada for a large range of mechanical, physical and chemical tests. Specific metallurgical testing services are also available.

Chemical Technology Services — A wide range of chemical and biotechnology services are provided to industry including analysis, testing, and product development. Capabilities in the area of chemical analysis include industrial and hazardous waste analysis, air quality monitoring, fuels and lubricants analysis, contaminant identification and specification verification. Product development capabilities include material evaluation and sourcing, micro-organism identification, formula review, quality control testing and process evaluation.

HIGHLIGHTS OF ITC ACTIVITIES:

Strategic Restructuring — During the year, a consolidation and restructuring of Industrial Technology Centre departments, programs and services was completed to more effectively and efficiently provide contract and technical advisory services to industry. This was performed to more closely match Centre services and capabilities with industry needs.

Networking — As the result of the cooperative agreement signed during the year between MRC and the University of Manitoba, an enhanced working relationship was established between the University of Manitoba Faculty of Engineering and ITC. To this end the Faculty and the Centre have agreed to jointly deliver and sponsor workshops and seminars to industry, sponsor a joint open house and cooperate on the identification and implementation of applied research and development projects for industry.

Technical Advisory Services — Under the technical advisory services program, supported by the NRC-IRAP contribution agreement and the provincial grant, 4665 client contacts were made during the year. Of the clients served, 69 percent were in Winnipeg and 31 percent in rural Manitoba. The ITC library collection expanded during the year to a total of 3000 books and 300 periodicals. The provision of a VSMF microfilm catalogue and industry standard service continued to be of notable benefit to industry clients. The library answered an average of 100 requests per month. During the year the advisory service instituted the demonstration of personal computer CAD systems to SME's. Over 15 firms were given demonstrations and assistance on personal computer-based CAD systems.

Contract Services — Contract revenue during the year was $1.453 million, representing a 9 percent decrease from the previous year. Four hundred and seventy seven contracts were completed representing an average contract value of $3050. Of the total contract revenue 43.4 percent was from industry sources, 31.8 percent from federal and provincial contracts and 24.8 percent from the National Research Council IRAP contribution agreement. Of the 477 contracts completed, 402 were for Manitoba industry clients.

Project Highlights:

- ITC began work on the first year of a three year project as subcontractor for the Methanol in large Engines (MILE) program as the analytical facility for fuel formulation and testing and emissions and lubricants monitoring.
- A considerable increase in the number of clients requiring analysis of environmental contaminants and pollutants, including PCB's occurred during the year. With anticipated changes to provincial regulations, the Technology Centre enhanced its capabilities and increased activities in the analysis of airborne contaminants in the workplace.
- The biotechnology group initiated a research project, funded by the provincial Strategic Research Support Program, on the use of hybridoma technology to produce monoclonal antibodies against specific wheat proteins. This is expected to result in a quick and reliable wheat cultivar identification test.
- Qualitative analysis for micro-organisms in diesel fuel continued to be provided to local farmers.
- A series of street lighting components were developed for a Manitoba based manufacturer. Services provided included product design, testing to CSA standards, and development of production test equipment.
- A major electronics design contract was completed for a large American electronics manufacturer.
- A specialized data collection system was developed for a Winnipeg garment industry client.
- A technical feasibility study was completed for a local manufacturer wishing to develop an automated sorting system for metals and alloys. This project included the evaluation of existing scrap metal sorting techniques and metal detection systems, plus a supporting analysis of the potential costs and benefits. Funding for the study was through the provincial Strategic Research Support Program.
- An ice jigger was developed for a northern Manitoba company. This device enables the under-ice towing and stringing of fishing nets. The project included a complete product design and the manufacture of prototypes.
- The design and development of the hydraulic system for a tree-delimber was undertaken for a northern Manitoba client. Development included re-designing of the existing manually operated product to enable automatic tree-delimbing. The new prototype will shortly undergo field trials.
- A project investigating the use of vibration signature analysis to identify defects in metal castings was completed. This project was funded by Energy, Mines & Resources Canada and utilized a variety of castings from local manufacturers.
- A feasibility study was completed into the development and application of rapid solidified materials technology within Manitoba. This project was sponsored by the provincial Strategic Research Support Program.
- Trouble-shooting and subsequent vibration analysis in steam turbine generator condenser tubes was completed using both strain gauge testing and modal analysis for a local client.
- During the year, several local and out-of-province vibration analysis and balancing projects were completed for pulp and paper industry clients.

TECHNOLOGY ADVISORY COMMITTEE

The Industrial Technology Centre uses an industry based technology advisory committee to provide advice on the types of services and capabilities required by local industry.

During the year, the committee was restructured to provide more broad based input from Manitoba industry. The new committee includes representatives from: The American Foundryman's Association, Manitoba Chapter; The Canadian Manufacturer's Association; The Brandon Economic Development Board; the Electronics Industry Association of Manitoba; Furniture West; The Manitoba Fashion Institute, Inc.; Manitoba's Economic Development Network; The Manitoba Trucking Association; The Winnipeg Business Development Corporation; The Mining Association of Manitoba; The University of Manitoba and Red River Community College.

Advisory committee members are: Mr. E. Crowder, Winnipeg (Chairman); Mr. J. Theaker, Abex Industries of Canada Ltd.; Mr. C. Coburn, Atom-Jet; Mr. A. Hayden, Unisys Canada Inc.; Mr. J. Chesterfield, Northern Telecom; Mr. J. Sammons, Fournier Stands Mfg. of Canada Ltd.; Mr. M. Silver, Western Glove Works Limited; Mr. W.K. Newman, The Mining Association of Manitoba Inc.; Mr. M. Babulic, Inco Limited; Mr. A. Harris, Manitoba Trucking Association; Mr. G. Hermanson, Red River Community College; Dr. T.R. Hsu, University of Manitoba and Mr. W.A. Reid, Canadian Bronze Company Limited.

MRC acknowledges the essential and valued contribution, guidance and advice of this committee.

TECHNOLOGY ADVISORY SERVICES

Manitoba Research Council's technology advisory services program for Manitoba industry is delivered in conjunction with the National Research Council's Industrial Research Assistance Program (IRAP). Supported both by a National Research Council contribution agreement and by the provincial grant, this technology transfer program helps industry solve technical problems; improve productivity; and introduce new materials, equipment and technology. There is no charge to the client for specific services under this program.

During the year advisory services staff answered 6627 requests for service, which was 109 percent of the level in the previous year. A total of 3006 clients were served, of which 539 were new clients. The distribution of clients was 66 percent in Winnipeg, 32 percent in rural Manitoba and 2 percent outside Manitoba.

During the year NRC and MRC-IRAP staff helped local industry obtain funding approval for 186 projects under the IRAP-H, IRAP-L and IRAP-M contribution programs.

REPORT OF THE PROVINCIAL AUDITOR'S OFFICE

We have examined the financial statements, being Exhibits A and B and Schedule 1, of the Manitoba Research Council for the fiscal year ended March 31, 1987. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the financial statements present fairly the financial position of the Manitoba Research Council as at March 31, 1987 and the results of its operations for the year then ended in accordance with the accounting policies stated in note 2 to the financial statements applied on a basis consistent with that of the preceding year.

June 30, 1987
Winnipeg, Manitoba

F.H. Jackson, C.A.,
Provincial Auditor.

MANITOBA RESEARCH COUNCIL

EXHIBIT A

BALANCE SHEET
as at March 31, 1987
(with 1986 figures for comparison)

	1987	1986
ASSETS		
Current:		
Cash	$ 5,500	$ 5,500
Funds on deposit with Minister of Finance:		
Trust accounts	331,821	815,704
Term deposits	1,416,628	839,595
	1,748,449	1,655,299
Accounts receivable		
Government of the Province of Manitoba	250,019	38,400
Government of Canada	85,842	70,411
Other	369,278	785,517
	705,139	894,328
Less: Allowance for doubtful accounts	13,437	259,016
	691,702	635,312
	2,445,651	2,296,111
Fixed: at cost (Note 2 and 3)	7,456,631	6,915,111
	$9,902,282	$9,211,222
LIABILITIES		
Current:		
Accounts payable	$ 432,955	$ 427,611
Advances on contracts	81,181	98,876
	514,136	526,487
Loan payable (Note 5)	90,306	98,752
Investment in fixed assets (Note 2)	7,456,631	6,915,111
Unexpended funds, Exhibit B	1,841,209	1,670,872
	$9,902,282	$9,211,222

EXHIBIT B

STATEMENT OF REVENUE AND EXPENDITURE AND UNEXPENDED FUNDS
for the year ended March 31, 1987
(with 1986 figures for comparison)

	1987	1986
Revenue:		
Grants from the Government of the Province of Manitoba	$2,957,000	$3,063,799
Contracts	2,330,778	2,295,491
Interest	77,033	35,600
Total revenue	5,364,811	5,394,890
Expenditure, Schedule 1:		
Operating	4,652,954	4,622,043
Capital	541,520	634,609
Total expenditure	5,194,474	5,256,652
Excess of revenue over expenditure	170,337	138,238
Balance of unexpended funds at beginning of year	1,670,872	1,532,634
Unexpended funds at end of year	$1,841,209	$1,670,872

SCHEDULE 1

SCHEDULE OF EXPENDITURES

for the year ended March 31, 1987
(with 1986 figures for comparison)

	1987	1986
Expenditures:		
Operating: (Note 4)		
Advertising and promotion	$ 11,935	$ 24,080
Bad debts	14,386	143,617
Building maintenance and repair	63,298	51,146
Computer related expenses	123,673	152,530
Equipment-rentals, maintenance and repair	38,475	36,206
Fees-memberships, seminars, customs, audit	109,440	83,435
Heating, utilities and taxes	154,941	136,042
Interest on loan	13,821	14,959
Laboratory supplies	233,833	224,572
Library — consultants and publications	75,931	125,513
Miscellaneous	182	—
Postage and telephone	110,637	82,439
Printing and stationery supplies	83,864	59,683
Purchased testing services	125,571	173,576
Real estate rental	156,660	176,388
Salaries and employee benefits	3,176,601	2,992,083
Staff transfer and relocation costs	7,067	8,946
Travel and transportation	152,639	136,828
	4,652,954	4,622,043
Capital: (Note 3)		
Equipment and furnishings	541,520	554,677
Buildings	—	80,000
Leasehold improvements	—	(68)
	541,520	634,609
Total expenditures, Exhibit B	$5,194,474	$5,256,652

NOTES TO FINANCIAL STATEMENTS

for the year ended March 31, 1987

1. Nature of Operations

The Manitoba Research Council was established in 1963 with the following objectives:

a) to promote and carry on research and scientific enquiries respecting agriculture, natural resources, industry or other segments of the economy of the province; and

b) to secure for Manitoba the benefits of research and scientific enquiries carried on elsewhere.

The Manitoba Research Council operates two laboratory facilities, the Canadian Food Products Development Centre in Portage la Prairie and the Industrial Technology Centre in Winnipeg.

2. Significant Accounting Policies

These statements are prepared on an accrual basis of accounting except:

a) Contract revenue is recognized when billed. Billings are made as work is completed during the project.

b) Fixed assets are charged to operating expenditures in the year of acquisition. Fixed assets are then capitalized at cost with a corresponding amount being reflected in "Investment in Fixed Assets." (Note 3)

3. Fixed Assets

	Balance March 31, 1986	Acquisitions	Balance March 31, 1987
Automobiles	$ 30,000	$ —	$ 30,000
Building	80,000	—	80,000
Equipment	6,045,178	539,889	6,585,067
Furniture and Fixtures	367,968	1,631	369,599
Leasehold Improvements	391,965	—	391,965
	$6,915,111	$541,520	$7,456,631

During the previous year, the building and associated land owned by The Manitoba Research Council for the Canadian Food Products Development Centre facility were transferred to Manitoba Properties Inc. The Council retains the use of these buildings and continues to pay the related operating costs exclusive of rent which is paid from an appropriation of the Government of the Province of Manitoba. This transfer was reflected by a reduction in fixed assets and investment in fixed assets of $1,202,321.

The building acquired for $80,000 in 1986 is located on land leased from the City of Winnipeg. The lease expires December 31, 1988; with the building then reverting to the City of Winnipeg.

4. Administrative Expenditures

The Department of Industry, Trade and Technology incurs certain general and administrative expenses on behalf of the Council which are estimated to be $37,500 for 1987 (1986 - $48,500). The related costs of this service are not charged to the Council and are not reflected in these financial statements.

5. Loan Payable

During fiscal year 1983/84, certain improvements were made to the facilities of the Industrial Technology Centre at a cost of $117,000. The cost was financed by way of a loan repayable over ten years in equal monthly installments of $1,855.63 including principal and interest. As at March 31, 1987, the outstanding loan principle amount was $90,306.10.

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The Manitoba Research Council is a member of The Association of Provincial Research Organizations, Inc.